Effective behaviour change in community environments: children in school

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Increasing the consumption of fruits and vegetables to at least five servings a day is a national prevention target in the USA[1]. Although fruits and vegetables are widely available, it is estimated that only 32% of adults and 16% of children aged 6–11 years eat the recommended number of servings[2,3]. This chapter describes three different programmes to increase children's fruit and vegetable intake using school-based approaches.

Schools are an attractive setting for modifying children's health behaviours[4,5]. Children attend school all week, and the daily routines provide a structure that permits repeated, sequential exposure to intervention activities. School-based approaches may be applied on multiple levels of intervention, including formal education, the school environment, the family and the community. School programmes may be designed to include venues that operate together to initiate and sustain behaviour change. Besides the classroom, venues may include the food sold on campus, social and celebratory school activities and school policies. School programmes are efficient and equitable because school attendance is mandatory, so the interventions may include all children and not overlook those from low income or minority homes. Students are available from year to year, so progress can be monitored. Finally, lifestyle habits like eating fruits and vegetables that track into adulthood can be established early.

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While these advantages are significant, there are nearly as many challenges. Demands on school curricula are heavy, and the school day is short. Schools are being required to address sex education, prevent drug and tobacco use, and deal with violence and prejudice, often without new resources. Nutrition has a hard time competing with these topics. Educators are pressured to teach 'just the basics' – language, social studies, maths and science – and periodic standardized tests of these few topics may be mandatory to pass students to the next grade or to evaluate a teacher's overall performance. Few teachers are trained in nutrition education, and even fewer know how to incorporate it into different subject matter curricula.

School meals also may not reinforce classroom nutrition education. In spite of efforts to improve cafeteria standards, school budgets for food and labour are low, equipment and kitchen facilities are limited, and the time allotted for children to eat is often inadequate. Fruits and vegetables are harder for schools to prepare than packaged foods. Perishable foods are more variable in cost and availability, require more refrigerator and preparation space, and take more time and skill to present in an appealing way, so they are harder for schools to use well. Finally, snack and fast food companies market directly to children and schools, while fruit and vegetable companies generally do not.

The California Children's 5 A Day – Power Play! campaign

In 1992, the California Department of Health Services began committing $300 000 year^{-1} for 5 A Day activities from its annual prevention block grant allocation from the Centers for Disease Control and Prevention (CDC). The California Children's 5 A Day – Power Play! campaign was developed to increase by 50% the fruits and vegetables eaten by children, aged 9–11 years or in the fourth and fifth grade, and their parents. The principal partners were the California Department of Health Services, the California Department of Education, the American Cancer Society and California's produce industry. A nutritionist skilled in the social marketing of fruits and vegetables was engaged to develop the new campaign.

Intervention

The intervention sought to reach its behavioural goal by developing, testing and offering kid-driven, user-friendly, research-based interventions to 40% of the state's 900 000 fourth and fifth graders and their parents through multiple channels by 2001. Five intervention channels were selected for the campaign: (i) schools, including classrooms and cafeterias; (ii) community youth organizations, to offer interventions after school, weekends and over the summer; (iii) supermarkets, for parents and children; (iv) farmers' markets, for education about fruit and vegetables and family-orientated shopping; and (v) mass media for children and adults. In 1998, family and chain restaurants were added as an intervention channel.

Two theoretical frameworks were used to design the interventions. Reciprocal

determinism was chosen because it builds on the interaction of the child with his/her environment[6]. Resiliency theory was used because of its success with older children in preventing drug, alcohol and tobacco abuse[7]. It teaches children how to resist negatives in their environments by focusing on four positive constructs: skills, norms, bonding/belonging and rewards/recognition.

Two types of formative research with children were conducted using a grant from the California Department of Education. Our mail and phone survey found that fourth and fifth graders ate only 3.4 servings of fruits and vegetables on a typical school day, compared with adult consumption of about 3.9 servings. Eight focus groups were conducted a few months after the 1992 national presidential election. They found that children understood the concept of a campaign and had definite ideas about what one should contain (Table 1).

Campaign collateral materials (Table 2) were deliberately designed as 'turnkeys' for adult intermediaries, requiring no special training and a minimum of advance preparation. Round table discussions with teachers had determined that school materials should avoid any appearance of being a curriculum but rather should show linkages with mandated curricula like social studies, languages, arts, science and maths. The *School Idea and Resource Kit* was the centrepiece of the campaign. It

Table 1 What children said they wanted in a statewide fruit and vegetable campaign

A campaign sounds good!
Have a catchy slogan and music!
Advertise!
'Do something' in school!
Have 'fun' activities!
Taste test new fruits and veggies!
Take a field trip to a restaurant!
Teach about recipes!
Make a special kids' cookbook!
Get mum and dad to eat more!

Table 2 California Children's 5 A Day – Power Play! campaign elements

Campaign logo, rap song, stickers, tee shirts
Help Kids Eat More Fruits and Vegetables (parent brochure)
Seasonal food page, colour editorials
Animated, live action public service announcements
School Idea and Resource Kit, mini-kit
Idea and resource kits for community youth organizations, farmers' markets and supermarkets
Kids … Get Cookin'! Cookbook

included 65 different activities designed in a one-page 'ready, set, go!' format and provided ready-to-photocopy student materials. Television public service announcements were developed using animated kids interacting with live children's celebrities.

The media and school components of the campaign were announced at a press conference in the summer of 1993. Over the next 2 years, collateral materials were developed, tested, revised and disseminated widely in the other channels. All materials for children and parents were in English and Spanish, while those for intermediaries were in English only. Pilot test results for the campaign elements during 1994 and 1995 were very promising. Teachers were enthusiastic about the positive, fun approach and the children's response to it. For example, an activity called 'Secret Snack Pals' proved to be a terrific ice breaker at the beginning of the school term. This activity taught respect for each other's foods, involved parents in classroom activities, and exposed children in a positive way to new foods. Teachers noted that after the activity more fruits and vegetables were brought to school as snacks, and junk foods decreased.

Based on this positive feedback, an evaluation grant was secured from the CDC and the National Cancer Institute (NCI) in 1996. The objectives were to determine the effectiveness of the Power Play! campaign in typical community conditions, comparing school-only and community-wide impacts with that of a control. Our expectation was that the community-wide intervention that involved all five intervention channels would increase fruit and vegetable consumption the most. A special 10-week evaluation study was designed. It included nearly 100 classrooms, over 3 schools, and nearly 4000 students. Out of the possible 65 activities in the *School Idea and Resource Kit*, teachers were required to select at least 10 from a core set of 14 that would employ all the theoretical constructs, different learning styles and multiple settings needed for behaviour change (Table 3). All three of the school communities had enrollments exceeding 60% of children qualifying for free or reduced-price school lunches and high proportions for whom English was a second language.

In the community-wide setting, a coalition of organizations worked together to support the participating schools by helping the teachers and also by sponsoring activities for children and their families (Table 4). A unique aspect was the coalition's

Table 3 Sample school activities included in the Power Play! evaluation study

Secret Snack Pals (exposes children to new foods, promotes acceptance among children)
Power Passport (child monitors fruits and vegetables for 3 weeks, 'journeys' to healthier eating)
Power Advertising (student groups critically analyse food ads, compete to create their own)
Survey Power (child 'reporter' interviews family about reasons for fruit and vegetable preferences)
Mini Salad Bar (cafeteria staff make salad bar for class)
Rap It! Power Play (class performs 'rap' song for the school)
Supermarket Sleuth (student finds certain fruits and vegetables throughout the store)

sponsorship of a celebratory Power Play! day for students and their families. Each organization in the coalition 'adopted' one school, made available a construction budget of up to $500, and worked with a group of students to design, build and staff an exhibit promoting their school's favourite fruit/vegetable recipe. The sponsoring organization prepared the recipe, and student exhibitors offered up to 600 samples during the event. Besides nutrition education, the goal was to expose the children to business practices needed to sell fruits and vegetables. In this agricultural community, the schools welcomed the interest shown by the business community.

Children's fruit and vegetable intake was measured pre- and post-intervention using a specially developed, validated 24-hour diary entitled the California's Children's Food Survey. All participating teachers were trained before instructing and supervising the children in class on how to complete the diary, starting on day 1 after lunch and finishing on day 2 before lunch. Each child recorded all the foods they ate throughout the day, including a special homework assignment for after school, dinner and the evening, citing the number of servings of each food they ate. Teachers checked the diaries for completeness, and specially trained technicians for the study cleaned and coded the fruit and vegetable responses. The response rate for the Children's Food Survey exceeded 95%.

The results of the study were positive, with the response being directly related to the amount of intervention (Fig. 1). In the control community, fruit/vegetable consumption dropped by 12%, while in the school-only community it rose by 7% and in the community-wide site it went up by 14%. Although the difference between the school-only and community-wide sites was not statistically significant, within the community-wide site increases observed between the two participating school districts were statistically different and corresponded directly with the amount of intervention in the two districts (data not shown).

The study was conducted during some of the worst agricultural flooding of the 20th century, and its effects on the control and community-wide sites were especially severe. We suspect that there would have been less of a drop in the control and more of an increase in the community-wide sites had weather conditions been normal.

The findings also were encouraging because consumption increased the most during the eating occasions over which the children had the most control, namely breakfast and snacks (Fig. 2). More details about the findings of this evaluation are available[8].

Table 4 Community-wide Power Play! activities

Community coalition was established
Public service announcements were aired during children's viewing hours
Schools were 'adopted' by produce companies and community organizations
Community youth organizations sponsored Power Play! activities
Supermarkets gave tours and offered interactive grocery bags
Farmers' markets provided classroom education
Power Play! day featured school booths, games and contests, costumed characters, sports figures and media personalities

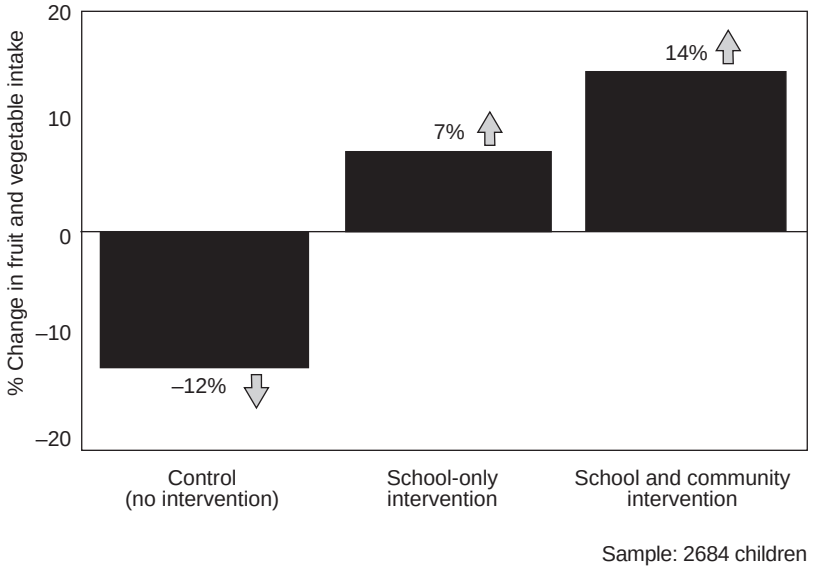

Fig. 1 Children who participated in Power Play! actually ate more fruits and vegetables. Source: California Department of Health Services

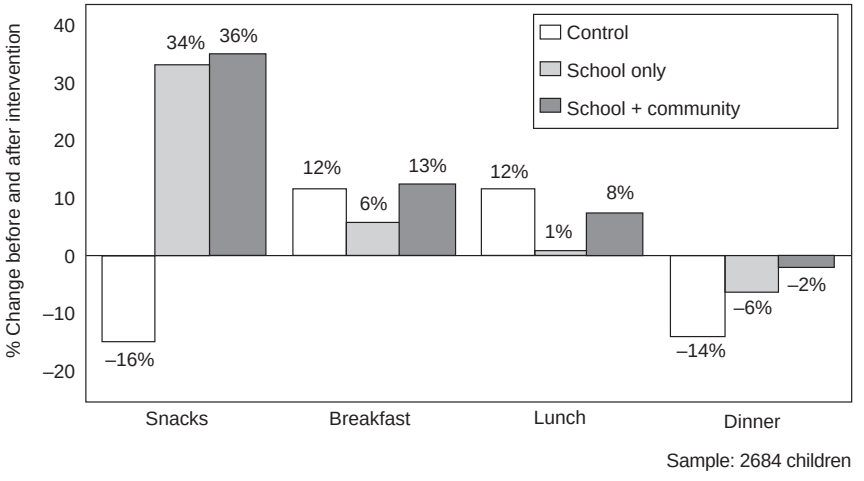

Fig. 2 Improvements in children's consumption occurred for eating occasions over which they had the most influence

Epilogue: In 1997, a 5-year grant for $4.5 million was awarded to the California Department of Health Services by The California Endowment, a major state philanthropy, based on the positive evaluation. Its purpose was for a statewide roll-out of the campaign by 2002. Coalitions in nine different media markets will be funded for 2 years each to organize interventions reaching a total of 105 000 new children every year. To update the programme, focus groups with children and intermediaries were conducted to determine what changes the materials needed. The physical activity, parental and restaurant components have been strengthened, and live action with real kids has replaced animation for television advertisements. The updated materials are provided free to the coalitions, teachers and youth group leaders. For the first time, the Power Play! spots will be aired as paid commercials during children's viewing hours to support coalition activities in each media market.

The Minnesota 5 A Day Power Plus Program: linking the cafeteria and classroom

5 A Day Power Plus was funded in 1993 by the NCI as one of nine research studies of the national 5 A Day for Better Health Program, and one of three that targeted elementary school students. 5 A Day Power Plus aimed to increase fruit and vegetable consumption among fourth and fifth grade students in 20 low-income, ethnically diverse, inner city elementary schools in Saint Paul, Minnesota. The study was a randomized trial with 20 schools matched on school size, per cent of students receiving free/reduced priced lunches, and ethnic composition of the student population. Schools were paired and randomly assigned to intervention and control conditions, with 10 schools in each condition. Students within schools were the unit of observation; schools were the unit of randomization and analysis. Baseline data were collected from fourth grade students in January–March 1995. The fourth grade intervention took place in March–May 1995. These same students received the intervention as fifth graders in the autumn of 1995. Follow-up data were collected from January to March 1996 (post-intervention).

Intervention

The intervention was based on social learning theory[9–12] and targeted factors that were hypothesized to be predictive of children's eating habits[13], including intentions to eat fruits and vegetables; role models for fruit and vegetable consumption; social support from peers, teachers and food service staff to eat more fruits and vegetables; skills to be able to ask for and choose more fruits and vegetables; expanded opportunities to eat fruits and vegetables; and incentives and reinforcement for participation, reaching goals and eating fruits and vegetables.

The intervention components included an 8-week classroom curriculum in the fourth and fifth grades, parent involvement and education, school food service changes, and industry support. Results from focus groups conducted with students,

parents, teachers and food service staff[14] and previous research on changing children's eating habits guided intervention development[13,15,16].

Two curricula were written for the Power Plus Program: 'HIGH 5' for fourth grade students and '5 FOR 5' for fifth grade students. Each curriculum included sixteen 30–45 min sessions, implemented twice a week for 8 weeks. The curricula included skill building and problem-solving activities along with weekly fruit and vegetable snack preparation and taste testing. Students formed teams during both curricula and did their activities in teams. Team competitions to eat fruits and vegetables at school lunch was a central component of each curricula; students were rewarded on an individual and team basis for achieving goals to eat 85 servings of fruits and vegetables at lunch over an 8-week period.

The parent involvement component included four packets brought home by the students in each grade level. Packets contained information about the curriculum, activities for parents and children to do together, recipes for the items students taste tested in class, and a return card that was brought back to the classroom and used as an entry for a classroom drawing. The fifth grade parent packets included 'snack packs' that contained information, brochures and recipes as well as the food for the snacks children had prepared in class so they could prepare these snacks for family members at home.

The food service environment was changed to support and reinforce the classroom and parent components of the programme. The focus of the food service component was to increase the appeal, choice and promotion of fruits and vegetables in school lunches. Students were given the opportunity to select from expanded choices of fresh or cooked vegetables and fresh or canned fruit daily. A 2-hour training was provided to all food service staff prior to implementation of the programme at each grade level to train and encourage them to increase the appeal of fruits and vegetables served, to identify available choices, and to promote fruits and vegetables using materials that linked the classroom to the cafeteria.

The industry component provided schools with linkage to, and support from, the broader community. Beckman Produce, Inc., a St Paul-based supplier of fruits and vegetables, provided fruits and vegetables for taste testings, snack packs and for expanding choice on the cafeteria line. An executive from Beckman's also made a 30 min presentation on fruits and vegetables to each of the 30 intervention school fifth grade classrooms. Dole Food Company, Inc., Nash Finch Company and other partners from Minnesota's 5 A Day coalition provided materials and incentives for the cafeteria, classroom and home packets.

Evaluation

The impact of the programme was assessed using a variety of methods, including: (i) observations of student intake at lunch to assess their dietary intake and fruit and vegetable consumption (n = 424); (ii) 24-hour dietary recall interviews to assess dietary intake and fruit and vegetable consumption over a 24-hour period (n = 407); (iii) a student questionnaire to assess factors related to fruit and vegetable consump-

tion (n = 1271); and (iv) a telephone survey with parents to assess availability of fruits and vegetables at home, parent fruit and vegetable consumption, parenting practices and attitudes towards fruits and vegetables (n = 324). In addition, 14 process evaluation tools were used to assess the degree to which the intervention was implemented as intended, the attitudes of teachers and food service staff towards fruits and vegetables, competing programmes that may have affected results, and attendance at training programmes.

Results

Details of the analysis methods and complete study results are reported elsewhere[17]. Process evaluation results indicate that all teachers and food service staff attended the trainings to implement the programme; the programme was implemented as intended in the classrooms and cafeterias; no differences in teacher or food service staff attitudes towards fruits and vegetables were found; and no external programmes competed with Power Plus during the study[18].

Outcome results indicate that the programme was effective in significantly increasing consumption of fruits and vegetables among students that received the intervention. At the end of the intervention, students in the schools that received the programme consumed significantly more fruit and combined fruits and vegetables at lunch than students in schools that did not. Significant differences favouring the programme were also found in vegetable consumption at lunch among girls; fruit consumption over the 24-hour period among all children; and the proportion of daily calories from fruits and vegetables. At follow-up, students in the intervention schools ate, on average, 0.47 more servings of fruits and vegetables at lunch and 0.58 more servings of fruits and vegetables throughout the day than did students in the control schools. The average intake of total fruits and vegetables at follow-up among intervention school students was 1.53 servings at lunch and 5.24 servings over the 24-hour period.

The analyses of the health behaviour questionnaire included nine variables; significant differences at follow-up were found in four of these. Students in the intervention group reported more perceived teacher support for eating fruits and vegetables, a greater perceived need to eat fruits and vegetables, more reports of asking for fruits and vegetables, and more usual daily servings of fruits and vegetables eaten than did students in the control group.

Of the six variables examined from the parent survey, only awareness of the 5 A Day Program was significantly different between conditions.

Discussion

The results of the 5 A Day Power Plus Program indicate that multicomponent school programmes that include classroom curricula, cafeteria changes, parent involvement and industry support can increase fruit and vegetable consumption in children. The

programme increased lunchtime fruit consumption and combined fruit and vegetable consumption among all children, lunchtime vegetable consumption among girls, and daily fruit consumption, as well as the proportion of total calories attributable to fruits and vegetables. Fruit consumption changed more than did vegetable consumption, girls changed more than boys, and change occurred at school but not at home. Possible reasons for these findings are discussed elsewhere[17].

Dole Food Company's 5 A Day programmes for children

Within the produce industry, Dole Food Company, Inc. has taken leadership in encouraging children to eat 5–9 servings of fruits and vegetables a day through its technology-based programmes for elementary schools and interactive retail programmes. A founding member of the national 5 A Day for Better Health Program, Dole's participation dates back over 12 years to the first 5 A Day coalition in California. The company's financial investment in 5 A Day educational programmes totals more than $18 million for 1991–2000, representing the Chief Executive Officer and the President of Dole's genuine commitment to 5 A Day and nutrition education.

Why children?

Wanting to play a vital role in the national 5 A Day Program, Dole made a strategic decision in 1991 to focus all of its nutrition education resources on children, 5–10 years of age, and their parents. To understand this target audience, Dole conducted extensive quantitative and qualitative research with children, parents, teachers and schools across the country. Children provided valuable insight into how to reach them with 5 A Day campaigns, advising: 'tell us clearly what you want us to know and do; don't preach to us; show us other kids eating fruits and vegetables; don't tell us they are good for us; get us involved; make it fun and exciting; make fruits and vegetables taste good; and put the message to music'.

Guiding principles

For a corporation, targeting children, even with a message like 5 A Day, can be a very sensitive situation. Dole follows a set of guiding principles in the development and implementation of all of their 5 A Day educational programmes for children.

1. Insuring the integrity of the nutrition message.
2. Keeping programmes non-commercial.
3. Engaging the learner interactively.
4. Utilizing multiple communication channels to reach children.

5. Being educationally compelling.
6. Maximizing technology, multimedia and the internet.
7. Combining entertainment and education – 'edutainment'.
8. Involving the family.
9. Partnering with government and health organizations.

5 A Day Adventures CD-ROM

Understanding the importance of computers in children's lives and how technology is changing the way they learn, Dole has been an innovator in the development of several technology-based 5 A Day programmes for elementary school children. In 1993, Dole launched the 5 A Day Adventures CD-ROM programme in collaboration with the Society for Nutrition Education. The CD-ROM, which is provided free to elementary schools in any quantity requested and is revised annually, is used in more than 60% of all elementary schools nationwide reaching millions of children. Utilizing interactive multimedia (video, graphics, audio, animation and text) the CD-ROM contains six cross-curricular educational modules with 5 A Day activities for the entire school year. The CD-ROM stars 42 animated fruit and vegetable characters, each with their own name, voice and personality, who enthusiastically encourage kids to eat 5–9 servings of fruits and vegetables a day. Original 5 A Day music, lesson plans, a direct connection to the *www.dole5aday.com* web site for kids, parents and teachers, and an e-mail address (fiveaday@bnt.com) for children to write to the fruit and vegetable characters enhances the motivational and educational value of the programme and makes it easy for teachers to incorporate 5 A Day into their curriculum. The 5 A Day Adventures CD-ROM is highly acclaimed by government health and education agencies, professional organizations, teachers, parents and children.

Building on its long-term commitment to children and elementary schools, Dole has developed: 5 A Day Live, a musical performance kit; 5 A Day Virtual Classroom, hosted on the internet twice a year; *Fun with Fruits and Vegetables Kids Cookbook*; How'd You Do Your 5 Today? chart with fruit and vegetable stickers; and the *5 A Day Adventures Newsletter* for teachers. It also sponsors the Creative 5 A Day Teacher of the Year award and 5 A Day Student Ambassador awards annually.

Synergy: Education Goals 2000 and Healthy People 2000

Dole's investment in developing CD-ROM and internet programmes has created an opportunity for synergy between national goals for health and education. By using technology-based 5 A Day programmes in their curriculum, teachers can meet Education Goals 2000's technology objectives while simultaneously working on Healthy People 2000's nutrition objectives. This synergy has contributed to the use of the 5 A Day Adventures CD-ROM in more than half of all elementary schools in the USA, far beyond expectations. This investment in 5 A Day technology also has global implications.

5 A Day Supermarket Tours and Adopt-A-School Program

To help retailers who want to reach elementary school children and make 5 A Day come alive in their shops, Dole developed the 5 A Day Supermarket Tours and Adopt-A-School Program. 5 A Day Supermarket Tours teach students about 5 A Day, which fruits and vegetables contain vitamin A, vitamin C and fibre, how to read nutrition labels and charts, and how to explain the importance of 5 A Day to their family. The tours also provide an opportunity to taste a variety of delicious fruits and vegetables. Thousands of supermarkets nationwide conduct 5 A Day Tours reaching approximately 5 million elementary school children each school year. To ensure educational value and effectiveness, Dole provides retailers with training, a comprehensive guide on how to implement 5 A Day Supermarket Tours, student take-home materials and assistance with media and publicity.

Commitment to 5 A Day beyond the USA

As the global interest in 5 A Day increases, nutrition education programmes for children become a top priority. For several years, the 5 A Day Adventures CD-ROM, Supermarket Tours and *Kids Cookbook* have been used in Canada to support the 'Reach For It – Eat 5–10 Servings of Fruits and Vegetables a Day' campaign. The CD-ROM (US version) is also used in New Zealand's primary schools. For Europe and Asia, these programmes are now being localized (with cultural and language revisions). A partnership between the German Cancer Society, German Societies of Nutrition and Dole has resulted in a German version of the 5 A Day Adventures CD-ROM programme for elementary schools in that country. Several German supermarkets are also conducting 5 A Day Supermarket Tours and internet programmes are expected soon. Dole-Japan is developing a Japanese version of the 5 A Day Adventures CD-ROM, to be available for schools in 2000.

Lessons learned in these school-based programmes

These programmes provide examples of a variety of approaches that can be used to reach children with the 5 A Day message. Each programme includes the elements that have been shown to contribute to the effectiveness of nutrition education[19]. Each is focused on changing a specific eating behaviour (eat five or more pieces of fruits and vegetables a day), versus focusing on a broad nutrition message (eat a healthy diet); each includes behavioural strategies to increase students' skills in incorporating more fruits and vegetables into their diet daily; and each is theoretically based. When used as planned these interventions also allow students adequate time and intensity of exposure to 5 A Day educational messages and activities, they involve the family and increase support for eating fruits and vegetables at home, and they provide students feedback about their current eating habits and the changes they make over time. Finally, these programmes provide linkages to the school cafeteria

and the community. These elements work synergistically to increase programme effectiveness. Used together these programmes, or programmes like them, provide programme planners and school staff the opportunity to reach children with repeated exposures to the 5 A Day message, using approaches that cross the educational curriculum, are compelling for teachers and easy for them to use, are interesting, exciting and interactive for students, and that reinforce the message in the school cafeteria, home and community.

Several lessons were learned in developing and implementing these programmes which may be useful to others conducting school-based programmes.

1. The involvement and support of school representatives is critical for successful implementation of nutrition education programmes in schools. Identify 'champions' within the school, district or community who are supportive of the programme, and involve school representatives in planning. Identify for decision makers how the programme may improve their students' current and future health, including their ability to learn. Outline the additional benefits the schools or district may receive (state-of-the-art materials, healthy snacks in the classroom, teacher or food service training, etc.). Highlight the contribution the programme will make to student educational attainment in the basic educational areas of reading, writing and maths as well as to coordinated school health activities and achievement of state or national educational standards for health.

2. Consider the time of year for offering your programme. Work with school or district decision makers to identify the timing that would work best for programme implementation. Prior to scheduling your programme activities be aware of the district and/or school calendar, and of any planned dates with which your programme might conflict. Plan well in advance to provide adequate time for communication, materials preparation and staff training.

3. Thoroughly train teachers to teach the programme, and do as much as possible to reduce the amount of time teachers will need to prepare for teaching the programme activities. Teachers respond very positively to having all student and parent materials copied and organized for them so that they may teach with minimal preparation time. If classroom taste testing is a component of your programme, work with the school food service or parents to ensure that food, paper products and instructions are provided so the need for advance teacher time is minimal.

4. Look for opportunities to reinforce the 5 A Day message in ways that are fun, interactive and interesting for students. The Dole CD-ROM helps students develop technology skills while learning new ways to eat more fruits and vegetables. This technology provides an easy way to bring nutrition education into the classroom and school media centre. Tours to local grocery stores and farmers' markets or visits from produce industry partners also support classroom 5 A Day activities and make the message real for students. Snack preparation and tasting in the classroom is another way to help students develop hands-on skills while reinforcing the 5 A Day message. This approach was very popular among students in the Power Plus Program. Teachers also indicated that they felt snack preparation was one of the programme's most successful elements.

5. Increasing the choices, appeal and promotion of fruits and vegetables in school cafeterias is a key component of successful school-based 5 A Day programmes. Schools should provide healthy environments where students may make choices from a variety of options and where modelling of healthy eating habits may be practised. Providing students with opportunities to choose a variety of fruits and vegetables in school lunches links the classroom to the cafeteria and helps make the cafeteria a 'learning laboratory'. Having a common goal helps to build a relationship between the food service and teachers and strengthens the role of food service staff as members of the school's health team.
6. Involving parents is challenging. Focus group results indicate that it is difficult for parents to find time to come to school events[14]. The results of the Power Plus and Power Play! programmes show that helping students change their eating behaviours outside school is difficult. More needs to be done to find effective ways to help parents support dietary change at home.
7. Industry partners can be supportive of 5 A Day programmes, and schools appreciate the opportunity to work with the food industry. Clearly identify the school's needs and ways that partners could address those needs. In addition to providing support by offering materials, food, incentives and presentations, industry partners may take a lead in developing new food products that incorporate more fruits and vegetables for use in school lunches and at home. Finding ways for industry to link with schools on an ongoing basis is another challenge that needs additional investigation.

Conclusion

These school-based programmes show that it is possible to increase fruit and vegetable consumption in elementary school children using a variety of strategies that involve technology, classroom lessons, snack preparation and tasting, school cafeterias and parents. In this time of decreasing consumption of fruits and vegetables among American children[20], this is an important result. Our challenge now is to find ways to provide the ongoing support schools need to offer effective, multicomponent programmes to improve students' eating behaviours. Without this critical next step we may not realize the potential to improve the health of today's children and tomorrow's adults.

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